

depend, in some degree at least, upon the colour of the fur. I have referred above to the slight importance of this character in determining species; and the following remarks occur in my description of *P. auritus* (at p. 84, 'Monograph of the Asiatic Chiroptera') :—"Examples from Northern Africa and sandy districts in the neighbourhood of the Mediterranean and Caspian seas are much paler in colour throughout than those from moister countries. This I have frequently observed in specimens of bats brought from desert regions."

Many specimens of a *Plecotus* with very light-coloured fur, but not otherwise distinguishable from *P. auritus*, were obtained by Dr. Stoliczka at Leh.

7. *Rhinolophus euryale*? (Severtzoff), =? *R. ferrum-equinum*, Schreber.

Rhinolophus euryale, Blasius, has not yet been recognized by other zoologists from any part of Asia north of the Himalayas; but *R. ferrum-equinum*, which it resembles very closely, is abundant in the Himalayan region. Therefore I would suggest that this species, which has been recognized as *R. euryale*, with doubt, by Dr. Severtzoff, is probably *R. ferrum-equinum*.

XV.—Notes on some Genera of Nudibranchiate Mollusca, with Notices of a new Genus and of some hitherto undescribed Species, in the Collection of the British Museum.
By P. S. ABRAHAM, M.A., B.Sc., F.R.M.S., F.Z.S.

[Plates VI. & VII.]

CALYCIDORIS, gen. nov.

Corpus subdepressum; pallium ultra caput et pedem extensum, papillis gracilibus obtectum; tentacula dorsalia laminata intra foramina retractilia; branchiæ simplices, laminatæ, in cavitatem subretractiles, anum circumdatæ, medialiter in dorso postico positæ; tentacula labialia in velum conjuncta; lingua angusta, ordinem uncinorum unum undique in longum exhibens.

The body is rather depressed; the mantle ample, extending over the head and the foot and bearing soft conical papillæ. The dorsal tentacles are short and laminated, and retractile within sheathless cavities. The branchiæ are simply laminate, form a cup round the anus, together with which they are contained in a common mantle-cavity, the wall of the latter being not completely contractile over them. The oral

tentacles are represented by a fleshy, laterally extended veil. The odontophore is narrow, bearing two bicuspid spines in each transverse row; no central spine, spinous collar, or under jaw.

This genus resembles *Acanthodoris* and *Lamellidoris*, especially the latter, in many characteristics of the buccal apparatus, *e. g.* in the buccal gizzard, and in the narrow odontophore bearing but two well-developed spines in each transverse row, as well as in the somewhat similarly shaped oral veil in place of labial tentacles; its soft pallial papillæ are also similar to those of *Acanthodoris*: but it widely differs from both the above, and approaches the restricted genus *Doris*, in the position of the branchiæ in a pallial cavity, into which they are, at least partially, retractile. It must therefore be considered intermediate.

Calycidoris Güntheri, sp. nov. Pl. VI. figs. 1, 1 a-1 c.

C. ovato-oblonga, subdepressa, lata; pallio amplo, papillis numerosis, elongatis, conicis, mollibus, confertis tecto; tentaculis dorsalibus brevibus retractilibus; branchiis 18-23, arrectis, brevibus, latis, lateraliter laminatis, confertim in calycem positæ, anum vix proeulcinentibus in cavitate pallii subretractilibus; velo capitis triangulari, crasso, hujus basi lata ad pedem conjuncta; pede triangulari, lato, truncato antice, angusto rotundatoque postice; lingua angusta uncinis duobus in quoque ordine transverso ornata.

The general shape of the body is a broad oval-oblong, rather wider anteriorly, and moderately depressed. The mantle is large, projecting over the head and laterally beyond the foot; the upper surface is covered with elongated, conical, soft papillæ, which are very numerous and crowded together upon the sides, but are fewer in number and smaller in size upon the back and upon the extreme edge. The dorsal tentacles, or "rhinophores," are short, apparently conical, minutely and diagonally laminated, and retractile within cavities, the margins of which are slightly raised and entire. The branchiæ, eighteen to twenty-three in number, form an elliptic cup with the long axis transverse. They are upright, short, broad blades with simple, lateral, overlapping laminæ, are set radially, closely applied together, with their slightly tuberculated roots extending inwards and becoming united round the anus; in this way the branchiæ appear to enclose a tuberculated space, as in *Lamellidoris*. The simple anal opening is a little posterior to, and to the left of, the true centre. The margin of the common cavity, into which the branchiæ can be partially withdrawn, is slightly raised and fringed with long papillæ. The oral

tentacles are united into a thick, fleshy, triangular veil, narrow from before backwards, but laterally extending to the anterior side angles of the foot. To the latter the base of the veil is attached for its whole length, with the exception of a small portion of the extreme pointed ends. The foot is triangular in shape, broad and truncate in front, then gradually narrowing to the posterior rounded end, which reaches as far as the hinder mantle-edge. The border is a little expanded and flattened. The mouth enters, from below, a chamber with slightly rugose walls, from which leads, anteriorly and above, the constricted opening of a muscular, smooth-walled gizzard, more resembling that of *Lamellidoris* than the homologous arrangement in *Acanthodoris*. At the back of the chamber is situated the anterior vertical portion of the narrow odontophore. This organ is without central spines, but is furnished with numerous transverse rows, each containing two bicuspid uncini or lateral spines (one each side), which are set diagonally. The inner and anterior cusp, in the well-developed tooth, is prolonged and recurved. The spirit specimens present a pinkish tint on the back, becoming darker and of a violet tinge on the sides and between the tentacles, and shading off into a light brown or flesh-colour, which extends all round the border. The darker tint is due to a minute and close purplish speckling which is seen, under the magnifier, between the papillæ, and upon them except at their apices. The dorsal tentacles and the branchiæ are opaque yellowish. The under surface is of a uniform flesh-colour.

Dimensions (in spirit)—length 28 millims., breadth 21, height (or greatest thickness between the pedal and the dorsal surfaces) 10.

Hab. not stated. The specimens were obtained from the Haslar-Hospital collection.

The species has been named after Dr. Albert Günther, to whose courtesy the author is indebted for the opportunity of examining the Nudibranchiate Mollusca in the collection of the British Museum.

HEXABRANCHUS, Ehrenberg.

Body more or less depressed, soft; mantle usually extended laterally and posteriorly, and with undulating border. Dorsal tentacles laminate, kneed, sharply bent, retractile within margined cavities. Branchiæ generally small and numerous, plumose, non-retractile, arranged in six to eight tufts, and set in a circle at some distance around the anal opening. Oral tentacles large, fleshy, ovoid, with crenulate edge. Mouth

generally with corneous jaws; odontophore broad, with numerous lateral spines in each transverse row.

The genus was constituted by Ehrenberg in 1831*, to include *H. prætextus* described by him, and *Doris lacera* of Cuvier†. The following may also be referred to the genus:—*Doris marginata* and *D. flammulata* (?), described and figured by Quoy and Gaimard‡; *D. sanguinea*, Rüppell§; *D. sandwicensis*, Souleyet||; *H. Adamsi*, Gray¶; and *D. superba*, *D. cardinalis*, and *D. sumptuosa* of Gould**. It is more doubtful whether *Heptabranhus Burnettii*, Adams, and *Doris* (*Rhacodoris*) *Krebsii*, Mörch††, should also be included in the genus. According to Adams's description and figure††, the former would seem to have all the more important characters of the Hexabranchs, with the exception of having the branchial bundles arranged round the anus "in a broad lunate series," instead of in a circle—an appearance which may have been due to the state of contraction of the specimen, and which, at any rate, is not, of itself, of sufficient importance to constitute a genus. M. Mörch has proposed "*Rhacodoris*" as a subgenus of *Doris*, to include the Mollusca of the type *D. lacera*, Cuvier, which he considers to have been wrongly referred to *Hexabranhus*, Ehr. He states that in the latter the branchial plumes are separately retractile in cavities as well as collectively into a common branchial cavity—an idea which also obtains in Adams's 'Genera &c.' In most of the descriptions, including those by Cuvier, Ehrenberg, and Rüppell, the non-retractibility of the branchiæ is given as a character. Of the twenty-nine specimens (representing five or six species) in the British-Museum collection, none shows any trace of retractile branchiæ. Judging from the imperfect description, *Rhacodoris Krebsii* will probably prove to be a species of *Doridopsis* §§.

* 'Symbolæ Physicæ'—Animalia evertebrata exclusis insectis.

† Annales du Muséum, vol. iv. p. 453, pl. lxxiii. f. 1-3.

‡ Voyage de l'Astrolabe, vol. ii. pp. 255 & 257, pl. xvii. f. 1-5, 6-10.

§ Atlas von E. Rüppell, 'Neue wirbellose Thiere des rothen Meers,' p. 28, T. viii. f. 1.

|| 'Voyage autour du Monde sur la Bonite,' Zoologie, tom. ii. p. 451, pl. xxv. f. 1-4.

¶ 'Figures of Molluscan Animals,' vol. iv. p. 104, tab. 219. f. 1.

** 'Otia Conchologica,' pp. 228, 229.

†† In 'Journal de Conchyliologie,' vol. xi. p. 34.

‡‡ 'Genera of Recent Mollusca,' vol. ii. p. 59, pl. lxiii. f. 10.

§§ Since the above was in type, the author has found that *D. Krebsii* has recently been dissected and described by Bergh (in 'Journal des Muséum Godeffroy,' Heft viii. p. 87), and shown to be a *Doridopsis*.

Hexabranchnus pellucidulus, sp. nov. Pl. VI. figs. 2, 2 a-2 c.

H. ellipticus, gibbus, pellucidulus, subgelatinosus, albus; pallio haud multo expanso, ad dorsum lateraque lævi vel subpustuloso, pone interque tentacula dorsalia corrugato, margine integro undulato; tentaculis dorsalibus obtusis, laminatis, pediculatis, flectis, opacis, prorsum confertisque positis, et in vaginulas retractilibus; branchiis parvis, ramosis, opacis, non-retractilibus, in sex cristis anum haud propinque circumdatis; tentaculis labialibus crassis, planis, foliiformibus, margine crenato; pede angusto, postice acuminato, margine anteriore transverse diviso, cum lamina posteriore fissa.

The general shape is elliptical, convex on the back, rather gelatinous. The mantle is comparatively not much expanded; it is smooth or irregularly subpustulose on the back; anteriorly, behind and between the dorsal tentacles, the surface is less gelatinous, and is finely and distinctly puckered into opaque pustules. The lateral expansions of the mantle, which, especially in small specimens, are not very wide, are fleshy and have the margin wavy, subcrenulate, and more or less reflexed in parts. The dorsal tentacles are short and thick, kneed somewhat backwards, laminated minutely and diagonally, with blunt rounded apices, retractile through short sheaths set far forwards and near together. The branchiæ are small and bipinnate, and form six, more or less irregular, non-retractile tufts at some little distance around the slightly raised anal opening. The oral tentacles are free, leaf-shaped, fleshy lobes, with crenate edge, and are set upon short peduncles. The foot is narrow: in front it is transversely slit, the anterior lamina being thin and entire, while the posterior is rather thicker, somewhat lobulate, and mesially divided. The mouth opens into the smaller end of a long, conical, muscular pharynx with longitudinally plicated wall. The odontophore is large, broad, and bilobed; the lobes are applied together; and their touching surfaces are supplied with numerous transverse rows of elongated, conical, recurved spines, none of which are central or of different shape. The colour of the spirit specimens is a transparent white, with the anterior pustules, the edge of the mantle-border, the dorsal tentacles, the branchiæ, and the foot yellowish and opaque.

The dimensions (in spirit) are—length 27 millims., breadth 21, height 12.

Hab. unknown.

H. lacera and *H. pellucidula* form a well-marked section of the genus. They resemble each other and differ from all the other species of *Hexabranchnus* in having the body raised and

somewhat subprismatic, and in having the mantle more or less pustulose, with its fore lateral and posterior border rather thick and comparatively but little expanded. *H. lacera* differs from *H. pellucidula* in bearing distinct, large, soft, rugose pustules upon the back, and in having the mantle-border deeply dissected and crenate.

Hexabranchus suezensis, sp. nov. Pl. VI. figs. 3, 3 a.

H. ellipticus, crassus, ad dorsum et subtus ad latera subpellucidulus; pallio lato, plano, margine tenni integro sed multo plicato; tentaculis dorsalibus parte superiore conica laminata, reflexa, prorsum confortisque positis et in vaginas breves retractilibus; branchiis numerosis, parvis, muscosis, non-retractilibus, in sex cristis anum haud propinque circumdatis; tentaculis labialibus magnis, crassis, ovatis, margine multilobulato; pede angusto, antice et postice rotundato, antrorsum cum transversa fossa brevi.

The general form is elliptic; the body is rather fleshy and somewhat semitransparent on the back and, underneath, on the sides. The mantle is smooth, with the expansion wide, especially posteriorly, and rather leathery in large specimens; its edge is thin and nearly smooth, and greatly folded or fimbriated; the origin of the lateral expansion is high in the middle region, but lower towards the head and near the branchiæ; in front the expansion is small, with the border thicker and more or less recurved. The dorsal tentacles are rather slender, with the upper half conical, sharply bent back (the angle being forwards and outwards), and having about seventy diagonal and wavy laminae proceeding from a slight, superior, longitudinal depression. The lower laminae do not extend round the tentacle. The cavities into which the tentacles are retractile are set far forwards and close together, and have the margins produced into short smooth sheaths. The branchiæ are small, complex, and dendritic in appearance; they are placed in six non-retractile tufts at some distance around the subcentral anal opening. The oral tentacles are large, fleshy, ovoid or leaflike, with a multilobulate border. The foot is narrow, rounded, and transversely grooved in front, rather acuminate, rounded, and with a small portion free behind. The mouth, large and exsertible, leads into a cavity, the lateral walls of which bear short, longitudinally striated, subcorneous jaws: the broad, heart-shaped odontophore is divided by a median longitudinal depression, above which the lobes are applied together and bear about twenty-two transverse rows of numerous, elongated, simple, recurved, pointed spines, none of which are central in position. The general colour, in the

spirit specimens, is a uniform light brownish, the tint becoming darker on the pallial expansion, on the dorsal tentacles, the branchiæ, and on the foot.

Dimensions (in spirit)—length 100 millims., breadth 82, thickness 21.

Hab. The Red Sea.

Two other species of *Hexabranchus* have been found in the Red Sea, *H. prætextus* and *H. sanguineus*. Irrespective of coloration and markings, the former differs from *H. suezensis* in having a more elongate outline, in being more depressed, in having no interval underneath between the foot and the mantle, and in having slenderer dorsal tentacles; the latter, in the shape of the tentacles, and in the larger, more slender, and less dendritic branchiæ.

PLOCAMOPHERUS, Rüppell & Leuckart.

Body limaciform. Mantle represented by a supracapital veil, bearing tuberculate or branched appendages on the margin, and by two or three tubercular processes upon each side of the back. Dorsal tentacles laminate and retractile. Branchiæ few, plumose, non-retractile, anteriorly surrounding the anus. The tail bears dorsally a wavy crest. Mouth with flat oral tentacles; odontophore with the spines near the middle bicuspid, but none median: an incomplete buccal collar.

The genus "*Plocamopherus*" was instituted by Rüppell and Leuckart* in 1828 for the reception of *P. ocellatus*, a mollusk from the Red Sea. The generic name was misquoted by Cuvier† as *Plocamoceros*; and this word was afterwards adopted by D'Orbigny and others. It has, however, been generally written *Plocamophorus*. In the 'Proceedings of the Zoological Society' for 1861, Mr. Pease has enunciated a supposed new genus "*Histiophorus*," which, from his description, would appear to have the same characters as *Plocamopherus*.

The species hitherto described are:—

P. ocellatus, Rüpp. & Leuck. *loc. cit.*

P. ceylonicus, Kelaart (sp.) and Ald. & Hanc. in Trans. Zool. Soc. vol. v. p. 133, pl. xxxii. f. 4–6.

P. imperialis, Angas, in Journal de Conchyliologie, vol. xii.

P. maculatus, Pease (sp.), *loc. cit.*

* Atlas von E. Rüppell, 'Neue wirbellose Thiere des rothen Meers,' p. 17, T. v. f. 3.

† "Règne Animal" (nouvelle édition, 1830), tom. iii. p. 52.

Plocamopherus nævatus, sp. nov. Pl. VI. figs. 4, 4 a.

P. elongato-ovatus, in regione branchiali prominens, hac longitudinis totius $\frac{2}{3}$ a capite sita, candidulus, irregulariter labeculis inequalibus fuscis maculatus, quæ prope branchias, post tentacûla dorsalia, in margine pallii capitis atque ad latera caudæ confertæ sunt; margine pallii capitis processibus brevibus tuberculatis instructo; tribus appendicibus conicis, sparse et minute tuberculatis, utrumque ad dorsi latus positis, quarum posterior major est; tentaculorum dorsalium parte laminata conica reflectaque, intus fusca, extus pallida, horum pediculis pellucidis, intra vaginas, quarum margo minute crenulatus, retractilibus; branchiis 5, anteriore centrali, reliquis utrumque ad latus ani positis, ex pediculo orientibus, ubique conferte maculatis, margine excepto; ano tubulato; tentaculis labialibus planis, ovatis, parce maculatis, margine crenulatis, capiti conjunctis, parte extrema laterali tantum libera; pede lineali, antice lato rotundatoque; cauda brevi, fastigio verticali, expanso, fimbriato.

The body is oblong, rounded in front, swollen and raised towards the middle, and acuminate behind. The dorsal surface gradually slopes from above the head up to the branchial region, which is situated at rather more than two thirds of the total length from the head to the tail. The supracapital veil has a short, free, upturned border, edged with short, sessile, tuberculated processes. The dorsal surface bears three pairs of lateral conical processes. The two anterior pairs are minutely and rather sparingly tuberculated. The better-developed hindmost ones, situated at some distance behind the branchiæ, have the bases swollen and with minute tubercles, while the apices are large, rounded, smooth, and opaque. The dorsal tentacles have the upper half conical, laminated, kneed in front, and recumbent, pointing backwards and inwards. The laminae are thirty-six to forty in number, and half of them go completely round the tentacle. They are retractile through short sheaths, which have minutely crenulate edges. The branchiæ are five in number, short, thick, and tripinnate; they are placed one centrally in front of the tubercular anus, and two at each side, arising from a short, broad, lateral pedicle. The mouth is subterminal, opening rather downwards. The oral tentacles are large, flat, ovoid or leaf-shaped lobes, with subcrenulate edges, and are adherent to the head except at the extreme lateral ends. The foot has in front a shallow, semicircular, transverse groove; it soon narrows and becomes linear for the greater part of its length, and extends to the end of the tail. A longitudinal groove runs down the centre, across which the wavy lateral edges can be applied together. The tail is laterally compressed, and bears

above a dorsally expanded, fimbriate, longitudinal crest, the margin of which is tuberculate or denticulate. Upon the sides of the body are a few minute rugose tubercles, similar to those upon the lateral processes; they are more numerous and larger behind the last pair of processes near the base of the tail. The general colour in the spirit specimen is whitish and semitransparent, irregularly spotted with small, brown, unequal blotches and speckles, especially close and dark around the branchiæ, behind the dorsal tentacles, on the upper border of the supracapital veil, and on the sides of the tail. They are small, close, and numerous on the sides of the foot. The bases of the lateral processes are spotted with brown posteriorly, the rest of the process being minutely dotted with opaque white. The large rounded apices of the last pair are opaque yellowish. The laminae of the dorsal tentacles are brown posteriorly or below, and shade off into brownish white above; the pedicles are semitransparent and white. The branchiæ are closely speckled with dark brown, except on the margins. The extreme edge of the oral tentacle is unmarked; then comes a row of minute, dark, close speckles, within which the surface is sparingly dotted. The lower surface of the foot is yellowish and free from spots.

Dimensions (in spirit)—length 35 millims., breadth 12, height 14.

Hab. New South Wales.

P. naevatus differs from all the other described species of the genus in not having the branchiæ on the centre of the back. It resembles *P. ocellatus* alone in having the lateral dorsal processes unbranched, and *P. imperialis* in having sessile marginal appendages to the frontal veil.

CERATOSOMA, Adams & Reeve.

Body elongate, prismatic, smooth or nearly so, ending in a bluntly pointed tail, the dorsal surface passing into a protuberance behind the branchiæ; mantle obsolete; dorsal tentacles laminate, generally retractile within cavities. Branchiæ plumose, with the roots more or less coherent, in front of and partially around the tubular anus, retractile within a smoothly margined cavity. Mouth subterminal, with a small deep pit at each side. Pedal surface long and linear, extending to end of tail, without free border, but with the edges contractile across the median groove. Odontophore broad, with numerous rows of simple spines, none of which are central; a spinous buccal collar.

In the diagnosis of the genus given by Adams and Reeve* the dorsal tentacles are said to be non-retractile—a statement repeated in Bronn's 'Thierreich'†, although corrected in Alder and Hancock's 'Synopsis'‡. They are certainly retractile in the four species represented in the British-Museum collection.

The following species of *Ceratosoma* have been hitherto figured:—*C. cornigerum*, Ad. & Reeve§ (= *Doris trifida*, Gray), *C. trilobatum*, Gray, and *C. gracillimum*, Semper||. The first alone has been described.

Ceratosoma tenue, sp. nov. Pl. VII. figs. 5, 5 a, b.

C. triangulare, prismaticum, lateraliter compressum, molle; dorso plano, leviter trilobato; tumore postbranchiali complanato ligulato; colore fulvescenti-lacteo, punctulis pallidioribus maculato, et lineis reticulatis remisse notato; tentaculis dorsalibus brevibus clavatis, ad apices rotundatis, minute laminatis, in foramina angusta profunde retractilibus; branchiis magnis gracilibus antetubulatum anum, e tribus radicibus orientibus, in foramen retractilibus; ore utriusque parva depressione prædito, pede lineali usque finem longæ caudæ extenso, margine antice lobulato et inflecto.

The body is prismatic, and is triangular in lateral outline, raised in the central branchial region, smooth and soft. The mantle is obsolete. The dorsal surface is flat or gently curved, and a little constricted behind the dorsal tentacles; it gradually rises from above the mouth, and culminates behind the branchiæ in a flattened, ligulate, roundedly pointed fleshy appendage. Beneath the latter the body falls abruptly, and then curves off into the laterally compressed, elongated tapering tail, which occupies about four tenths of the total length of the animal. The thickened and slightly overhanging border of the supracapital surface is marked by a rather thick semitransparent line lying between two opaque irregular ones. Two pairs of short, curved, similarly bordered lines are found upon the sides of the dorsal surface, and a somewhat similar marking margins the postbranchial protuberance. The dorsal tentacles are short, clavate, rounded at the apex, and minutely and diagonally laminated; they are retractile within deep narrow cavities, which have the border slightly protuberant. The branchiæ, about twenty-one in number, are long and slender, and arise

* 'Zoology of the Voyage of H.M.S. Samarang,' Mollusca, pp. 67 & 68, pl. xix. f. 5.

† 'Thierreich,' Band iii. p. 798.

‡ 'Monograph of the British Nudibranchiate Mollusca,' Appendix, p. xix.

§ *Loc. cit.*

|| 'Reisen im Archipel der Philippinen,' Theil 2, Band ii. Heft 5, t. 25. f. 8.

from a common base in front of, and partially sheathing, the broad, tubular, fimbriate anus. The central plume is distinct and the longest; after giving off two long lateral branches, at about half its length, it becomes bifid. The other plumes, about ten each side, arise from a lateral arm of the base, produced and incurved posteriorly; they diminish in size and become more crowded backwards, and many of them divide once or twice dichotomously; they are all pinnate, with delicate, overlapping, lateral laminae. Together with the anus, they are retractile within an anteriorly lipped circular cavity, which is situated a little behind the central point of the body. The mouth is large and, when contracted, a longitudinal fissure, opening rather downwards. There is a semicircular transverse furrow above, and, at each side, near the foot a deep rounded pit. The pedal surface is a long and linear deep groove, extending to the end of the tail; the lateral edges are crenulate and can be approximated together across the middle line, but there is no free border; anteriorly it is rounded, with the margin inwardly fleshy and lobulate. The general colour of the animal is a brownish cream, with small, scattered milky spots and faint, reticulating, ocellated markings; the stalks of the branchiae are sparingly spotted or lineated with opaque white.

Dimensions (in spirit): length 65 millims., breadth 14, height 18, length of the tail 29.

Hab. unknown.

C. tenue differs from *C. trilobatum* and *C. gracillimum* in wanting the latero-dorsal lobation and in having a comparatively shorter tail.

Ceratosoma brevicaudatum, sp. nov. Pl. VII. fig. 6.

C. oblongum, levatum, sublæve, cervinum, ocellis albis tubercularibus sparse maculatum; cauda brevi; dorso vix lobato; tumore postbranchiali parvo, rotundato, supra plano; tentaculis dorsalibus obtusis, rotundatis, laminatis, intra vaginas breves retractilibus; branchiis brevibus, gracilibus, ramosis, ex sex radicibus orientibus, ante anum semicirculariter positiss, et in foramen commune retractilibus.

The body is elongate, but compact and raised. The dorsal surface is oblong, indistinctly trilobed in outline, curving upwards from above the mouth, the highest part being in front of the branchiae. Behind the latter the outline abruptly acuminate and passes into a small, rounded, nodular protuberance, flattened above. Beneath this the body-wall falls nearly perpendicularly, and then ends in a short, laterally compressed, conical tail. The dorsal tentacles are clavate, the upper half flatly rounded at the apex, being bent back and bearing about

twenty-five laminae; they are retractile within cavities, the margins of which are produced into short sheaths. The branchiae are small, slender, bushy, dividing dichotomously, and arising from six roots, three being at each side of the anus; there is a considerable interval between the anterior roots; and the posterior ones bear numerous and smaller plumes. The anus, situated almost between the last, is wide and tubular, and has the posterior wall more produced than the anterior. The common cavity, into which the branchiae and anus are retractile, has the margin raised. The mouth is subterminal, opening rather downwards; on each side is a conspicuous pit, into which it is possible that a small tentacle may be retractile by invagination. The foot is linear, with a wavy edge, anteriorly lobulated inwards. The colour of the spirit specimens is a brownish cream or pale fawn, sparingly marked with whitish, tubercular, or slightly raised, unequal, rounded, ocellated spots, which are rather more numerous on the sides; a row of five or six of these spots extends along the medio-dorsal line from in front of and between the dorsal tentacles; the margins of the branchial and tentacular cavities are surrounded by a row of such spots.

Dimensions (in spirit): length 48 millims., breadth 15, height 18, length of tail 9.

Hab. Australia.

C. brevicaudatum presents many points of resemblance to the following species (*C. oblongum*).

Ceratosoma oblongum, sp. nov. Pl. VII. figs. 7, 7 a, 7 b.

C. elongato-oblongum, prismaticum, laeve, fuscum, nigrescentibus maculis rotundatis sparse ornatum; dorso oblongo, non lobato et non levato; tumore postbranchiali parvo, rotundato, nodulari; cauda brevi; tentaculis dorsalibus parvis, conicis, acutis, arrectis, lateraliter compressis, in cavitates retractilibus; branchiis $18 \pm$, ramosis, ex sex radicibus orientibus, ante anum circulariter positiss, in foramen commune retractilibus; pede lineari.

The body is oblong, smooth, prismatic, not raised in the branchial region; the dorsal surface is rather curved, and shows but little trace of constriction or lateral lobation. The postbranchial protuberance is small, rounded, and nodular; and between it and the origin of the short subconical tail there is but a very small interval. The dorsal tentacles are conical and pointed, laterally flattened, diagonally laminated, directed rather forwards and outwards, and retractile within cavities. The branchiae are about eighteen in number, slender, and placed in a semicircle in front of the anus; those at the sides are rather longer. The four anterior, with an interval between the two foremost, arise separately; the others, six on

each side, form a kind of spreading fascicle. They are all more or less ramose, dividing dichotomously. The anus, situated between the posterior branches, is tubular, broad and short. Branchiæ and anus are contained in a common pallial chamber. The mouth is directed rather forwards, and is bounded by thick exsertible lips; on each side is a pit, into which a soft appendage appears to be retractile. The foot is linear, rather enlarged and rounded in front, where it is transversely grooved, somewhat fleshy, and inwardly lobulated. The colour is a uniform dark umber-brown, with sparing and indistinct, dusky, rounded and ocellated spots, some of them very slightly raised, on the sides, and with a few on the back.

Dimensions (in spirit)—length 51 millims., breadth 16, height 16, length of tail 11.

Hab. West Australia.

The short tail and the nodular postbranchial protuberance differentiate *C. oblongum* from all the other species except *C. brevicaudatum*. From the latter it principally differs (without regarding the colour) in the form of the dorsal tentacles, in the comparatively depressed branchial region of the back, and in the small interval between the postbranchial protuberance and the origin of the tail.

TREVELYANA, Kelaart.

Body limaciform, rather swollen or raised in the central region. Mantle obsolete. No appendages. Dorsal tentacles laminate and retractile. Branchiæ pinnate, non-retractile, placed around the anus almost on the centre of the back. Mouth without oral tentacles or veil, and without collar or jaws. Odontophore broad, bearing simple spines.

The genus was instituted by Kelaart in 1859 for the species *T. ceylonica*, described by him*. Another species, *T. bicolor*, was added by Alder and Hancock†, by whom a better definition of the genus was given. Since then *T. morosa* has been figured by Bergh‡. "*Doris limacina*," Quoy & Gaim.§, and "*Doris impudica*," Rüpp. & Leuck.||, may be referred to this genus.

* Ann. & Mag. Nat. Hist. ser. 3, vol. i. p. 257; and Journ. Asiatic Society.

† Transactions of the Zoological Society, vol. v. p. 132, pl. xxix. f. 11 & 12.

‡ Semper's 'Reisen im Archipel der Philippinen,' Theil 2, Band ii. Heft 5, tab. 25. f. 9.

§ 'Voyage de l'Astrolabe,' vol. ii. p. 252, pl. xvi. f. 8 & 9.

|| Atlas von Rüppell, 'Neue wirbellose Thiere des rothen Meers,' p. 33, T. x. f. 2.

Trevelyana concinna, sp. nov. Pl. VII. figs. 8, 8 a, 8 b.

T. lævis, in regione branchiali levata, dilatataque, pallio distincte carens, unicolorata; tentaculis dorsalibus parvis rotundatis, minute laminatis, confertis, retractilibus; branchiis sexdecem, arrectis, bipinnatis, non-retractilibus, medialiter in dorso, ante et partim circum anum positis; pede ad finem caudæ extenso, antice cum fossa transversali cujus lamina anterior lata est, et in duos lobos læves rotundatosque medialiter divisa.

The body is elongate, somewhat compressed laterally, convex above, the central branchial region being the highest, smooth. There is no indication of a mantle, nor any appendages. The dorsal tentacles are short, rounded and nodular, finely marked with rather upright laminae, and retractile in cavities which are placed close together on the head. The branchiæ, fourteen to sixteen, are upright, bipinnate, non-retractile, set on the centre of the back at a little distance from and around the anus, in an arc occupying three fourths of a circle, the convexity being forwards. The integument is gently raised outside the plumes. The mouth is terminal, without oral tentacles, but their position is indicated by two indistinct slightly raised oval surfaces placed superiorly to the opening. The foot is linear, truncate in front, and extends behind to the end of the tail, where it terminates in a point; in front there is a deep transverse groove, the anterior lamina of which is wide antero-posteriorly, and divided by a median depression into two, flat, rounded lobes; the border of the foot is rather thickened and free. The colour of the spirit specimen is a light semitransparent brown, with the tentacles, the branchiæ, and the foot opaque.

The length in spirit is 30 millims., the breadth 10, the height 12.

The specimens were obtained in the Gulf of Suez.

T. concinna appears to differ from *T. ceylonica* principally in the absence of markings, from *T. impudica* in the absence of dorsal tubercles, and from the other species in the shorter and less depressed body.

EXPLANATION OF THE PLATES.

PLATE VI.

- Fig. 1. Calycidoris Güntheri*, upper surface. 1 a. Branchiæ, enlarged. 1 b. Under surface. 1 c. Side view.
Fig. 2. Hexabranhus pellucidulus, side view. 2 a. Upper surface. 2 b. Another specimen, side view. 2 c. Under surface.
Fig. 3. Hexabranhus suezensis, half nat. size, seen from above. 3 a. Seen from below.
Fig. 4. Plocamopherus nævatus. 4 a. Under surface.

PLATE VII.

Fig. 5. *Ceratosoma tenue*. 5 a. Seen from below. 5 b. Seen from above.

Fig. 6. *Ceratosoma brevicaudatum*.

Fig. 7. *Ceratosoma oblongum*. 7 a. Seen from below. 7 b. Seen from above.

Fig. 8. *Trevellyana concinna*. 8 a. Seen from above. 8 b. Seen from below.

XVI.—On *Anthracosaurus Russelli* (*Huxley*).

By THOMAS ATTHEY.

[Plates VIII.—XI.]

In the 'Quart. Journ. Geol. Soc.,' 1863, vol. xix. p. 56, Prof. Huxley has described and figured the palatal aspect of the skull of *Anthracosaurus Russelli* from the Lanarkshire coal-field, 12 miles east of Glasgow.

In the 'Annals and Magazine of Natural History,' September 1869, there is a description of a large portion of another cranium and the anterior extremity of a mandibular ramus, together with a large sternal plate, of this powerful Labyrinthodont, from Newsham, Northumberland.

Also, in the February number (1871) of the 'Annals,' there appear a description and figure of a considerable portion of a mandibular ramus of the same animal, from the new ironstone shale of Fenton, Staffordshire, by my late lamented friend Mr. Albany Hancock and myself.

In the present communication I propose to describe and figure the upper and under surfaces of the cranium, the right and left rami of the mandible, the teeth with microscopic sections of the same, several ribs and vertebræ, one bone of an extremity, and some scutes, all belonging to one and the same *Anthracosaurus*, obtained about two years ago from the black shale overlying the Low-Main seam of coal at Newsham, near Blyth, Northumberland, by one of the workmen, of whom it was purchased through Mr. T. P. Barkas of this town. It was in a very rough state and much broken when it came into my hands, and has required for the redevelopment of its principal features an amount of minute work, care, and time that can be appreciated only by those who have been engaged in similar undertakings.

Further, there are certain things here to be mentioned as still obscuring or hiding more or less the upper surface of the skull. First, there is a crack or fissure across the anterior end, a short way behind the snout, through the nasal bones, and